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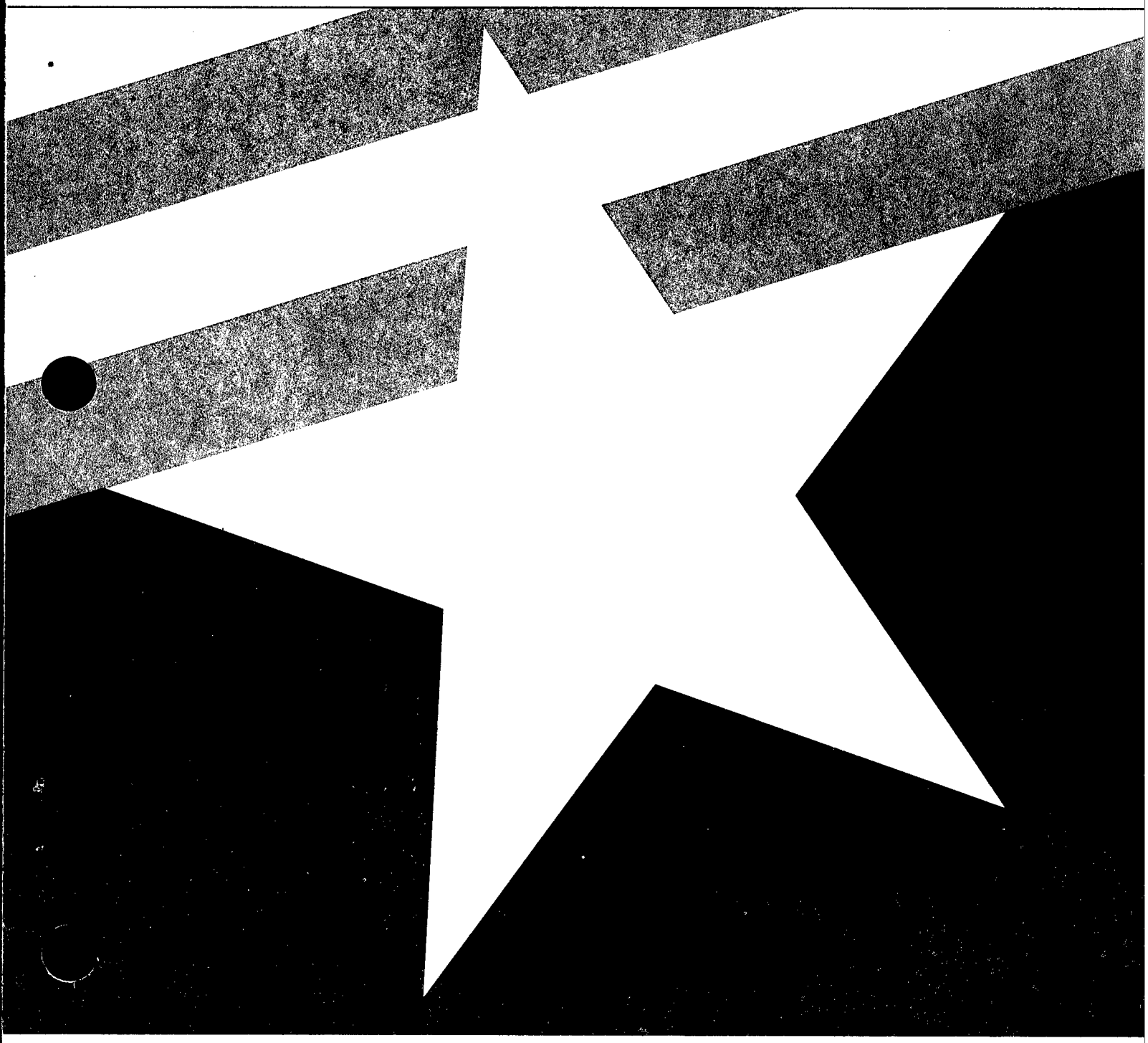

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Safe Army Now

A Commander's Guide for Increased Readiness

In World War II, one out of every five American soldiers killed died as a result of an accident. **In Korea**, more than half the Army personnel who were hospitalized were injured in accidents. **In Vietnam**, accidents claimed more than 5,700 lives, disabled more than 106,000 soldiers, and produced nearly 5 million nondisabling injuries. **Each year**, we kill the equivalent of a battalion of soldiers in accidents; we lose the equivalent of an entire mechanized infantry brigade for more than 6 weeks because of accidental injuries. The $300 million direct cost of 1 year's accidents would put 150 M1 tanks in the field or the same number of attack helicopters on the flight line. **The cost of accidents** is high and increases each year. The cost must be paid, and it is, in one form or another, out of readiness. Once lost through accidents, combat power is forever lost for the battle. Accidents are a drain on combat readiness the Army simply cannot afford.

Operational commanders are in the best position to make safety an integral part of tactical operations. The best way to do this is to **integrate safety into the process you use to develop a tactical operation**. This integration must begin the moment the mission is conceived and continue until the last lesson learned is written and acted upon. Before safety can be integrated into the operational process, the process itself must be clearly defined.

Figure 1 depicts a basic operational process. The left column outlines major mission phases, and the middle column depicts typical operational activities associated with each mission phase. The right column lists a variety of safety-related activities that can be used in various combinations to improve safety. Although these activities are shown separately, it must be emphasized that they take place as part of the operational activities shown in the middle column.

Mission Phase	Operational Activity	Safety Activity
Commander's Mission	• Initial estimate • Evaluate mission options • Develop operational alternatives • Decision-making	• Mission analysis • Hazard assessment • Risk assessment • Risk matrices • Risk reduction options
Preparation of Operation Plans and Orders	• Mission briefing • Company level plans/orders	• Safety input to briefings, orders, and SOPs • Special safety briefings and training
Preparation for Operations	• Prepare equipment • Prepare troops • Make necessary changes	• Safety checks • Special training • Higher-level support
Conduct Operations	• Lead tactical and logistical operations • Change plans as required	• Enforce compliance with safety guidance • Review changes for risk implications
After Action	• Assess performance strengths and weaknesses	• Assess risk management effectiveness

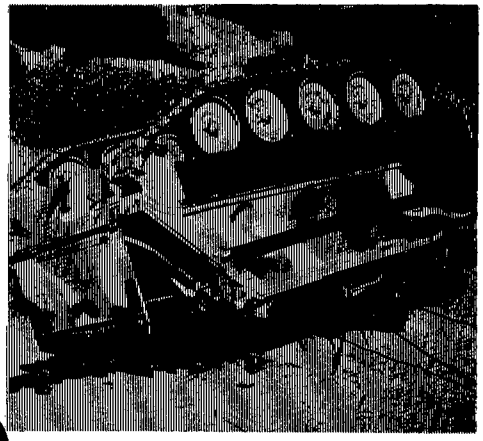
Figure 1. Basic Operational Process

Army accident experience shows that, in the absence of command-defined risk parameters, individual soldiers decide for themselves what level of risk they will accept.

What if . . .?

On the following pages are synopses of Army accidents that actually happened. What if the risk management process had been used before these missions? Would the results have been the same?

• **The unit was participating in a field training exercise at the National Training Center.** At about 0130, an M113A1 armored personnel carrier with **an inoperative communication system** was dispatched on a patrol/scout mission. The mission was to scout for "enemy" positions while traversing the forward area **at night without lights** (total blackout). There was a sense of urgency because of a **last-minute change** in the unit's mission due to communication problems with higher command. The new mission required the scout track to **operate in an area other than the area planned** and to be on the move immediately. **The crew was fatigued** and had been on the move most of the previous 48 hours. They had had only one period of 2 to 3 hours of uninterrupted sleep and other rest periods were short and intermittent. At about 0300, the M113 hit a 5-foot dropoff in the tank trail and rolled onto its top. One crewmember was crushed by unsecured cargo.



Mission analysis. When you are assigned or create a mission, as part of your initial estimate you immediately begin to break it down into its component parts; e.g., movement to the operations site, night convoy, movement to contact, assault on an objective, etc. To build safety into an operation, you must first "see" the operation in these same component parts. Operations also have a time factor—a beginning-to-end series of events in which the timing of events is often as significant as the events themselves when evaluating risk. The objective is to reflect the total life cycle of the operation from the first preparatory actions until the soldiers are back in the barracks or the next phase of operations is under way.

The mission analysis is nothing new. A good commander and tactician analyzes the mission in this manner regardless of safety needs. This same analysis makes it possible to systematically and objectively inject safety into the operational process.

Risk assessment. There are no hard and fast rules for assessing risks. The bottom line is that commanders have some flexibility in planning and execution and can reduce the probability or severity of an accident.

Risks may be assessed by first measuring the various risks, combining their values, then making a value judgment of what safety precautions are appropriate. By adding the values together, the commander can determine if a proposed mission falls within acceptable risk parameters. He then has the option to take action to reduce the risk as time and flexibility permit. As a minimum, he will become aware that he is functioning in a variable risk environment.

What if . . . ?

• **The unit was in the field to support infantry platoon-level ARTEP training** and to train for its own upcoming unit ARTEP. At about **0430 on the fifth day,** the unit was preparing to dispatch five UH-1H helicopters on a troop extraction mission. There was no official weather forecast or observation available; **the ceiling was estimated to be below 100 feet, and visibility was limited to one-half to 1 mile** due to darkness, fog, and clouds. The commander **placed the mission on a weather hold** but decided to reposition the aircraft from their tactically dispersed parking areas to a large cleared area. One of the aircraft, which was parked in a small clearing **surrounded by 50- to 60-foot trees,** was started and began a straight-up hover to an altitude of about 80 feet, where it entered the **fog and clouds.** It accelerated forward and, moments later, crashed in a small valley after flying through the tops of 25- to 30-foot hardwood trees for about 100 meters. The three crewmembers aboard were killed, and the aircraft was a total loss. The pilot-in-command, who had been a **PIC for only 2 weeks, had a total of 482 hours of flight time; his copilot had a total of 245 hours.**

For the most part, risk measurement is a subjective assessment of hazards. What is needed is a quick test to measure the risks involved in a wide spectrum of operational missions. The act of consciously evaluating a mission results in the commander's thinking through the factors that affect mission safety.

Different missions will involve different elements that can affect mission safety. However, seven elements—planning, supervision, soldier endurance, soldier selection, weather, mission complexity, and equipment—are central to safe completion of any operation. Using matrices that assign a numerical value to each of the elements is one way of quickly gaining an appreciation of overall risks. The following matrices offer examples of risk assessments for each of the seven elements common to all missions. Keep in mind, however, that these are arbitrary weighted factors; modify them to accommodate particular missions and units.

Planning. The planning element is measured by comparing guidance to preparation. Specific guidance and indepth preparation are optimal.

Planning

Risk Value			
	Preparation		
Guidance	Indepth	Adequate	Minimal
Vague	3	4	5
Implied	2	3	4
Specific	1	2	3

Example: A specific request received in the unit 3 days in advance would be assessed a risk value of 1. A vague request received only hours in advance would be a 5.

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By changing the elements, aviation commanders can apply the risk factor matrices to their operations.

Six things company commanders can do to save lives and equipment

1. **Set high standards.** Set and enforce high operating standards in every activity of your unit. Safety is a by-product of professionalism, of doing the job right the first time every time. By-the-book, disciplined operations are mandatory.
2. **Know your soldiers.** Know their training status and their qualifications. Test new people's knowledge, regardless of whether or not they have been previously operator certified. This applies to weapons, every type of moving equipment, even gas masks—all equipment.
3. **Know your equipment.** Know its capabilities and its condition. Numerous check sheets and publications are available to guide you.
4. **Apply dispatch discipline.** Many accidents involve equipment that should not even be out of the motor pool or off the helipad. Commit the use of equipment only when necessary, only when it can contribute to genuine training in the unit mission. Tough-minded dispatch discipline reduces exposure to accidents.
5. **Manage risks in training.** Integrate the requirement for safety with the demand for realistic combat training. A high degree of safety can be achieved through the systematic management of inherent mission risks. (A practical process for managing these risks is included in this pamphlet.)
6. **Maintain awareness.** Be constantly aware of the mission-critical importance of safety in all your operations. You cannot allow yourself to relax your vigil and become complacent when everything is running smoothly. Continuous awareness of the requirement for integrating safety into all day-to-day unit operations is essential to maintaining peak readiness.

Complexity is measured by comparing operations length in time to condition of operational area. Continuous operations of 48 hours without sleep is seen as the noncombat tactical limit. The operational area is factored by terrain considerations such as obstacles and vegetation.

Complexity

Risk Value

Operation Length	Operational Area		
	Improved	Tactical	Unknown
48 hours	3	4	5
24 hours	2	3	4
8 hours	1	2	3

Equipment is measured by considering maintenance status and age.

Equipment

Risk Value

Equipment Age*	Maintenance Status			
	Highly Maintained C-1	C-2	C-3	Not Combat Ready C-4
Old	3	4	5	5
Average	2	3	4	5
New	1	2	3	5

*Old = Within 75 percent of time-life as defined by appropriate TB 43 series.

Average = Within 26-74 percent of time-life as defined by appropriate TB 43 series.

New = Within 25 percent of time-life as defined by appropriate TB 43 series.

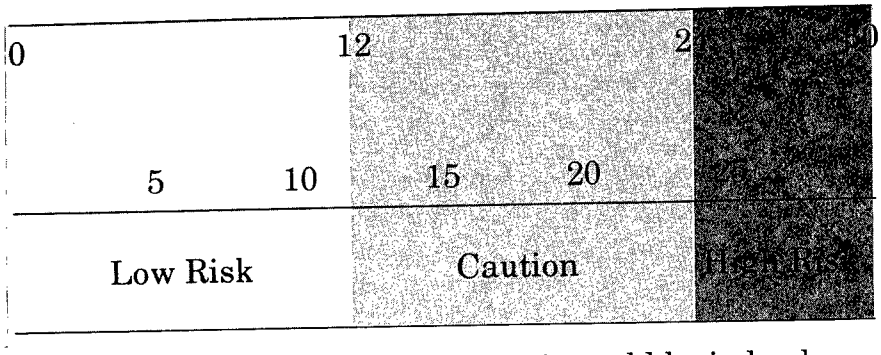
Proven Success Factors

The Army Safety Center visited three battalion/squadron-sized organizations with good safety records to determine what factors contributed to their low accident rates. Five factors were common to all three organizations:

- Performance criteria were precisely defined.
- All personnel were acutely aware of the performance criteria.
- Training was conducted to a high standard.
- Immediate and effective action was taken to deal with any deviation from established performance criteria.
- Operations were conducted by the book, and unit morale was high. In fact, in every safety study we've seen, where units were safe, troop morale was high.

The last factor is extremely important. **Unit members were proud of the fact that their organization conducted operations by the book.**

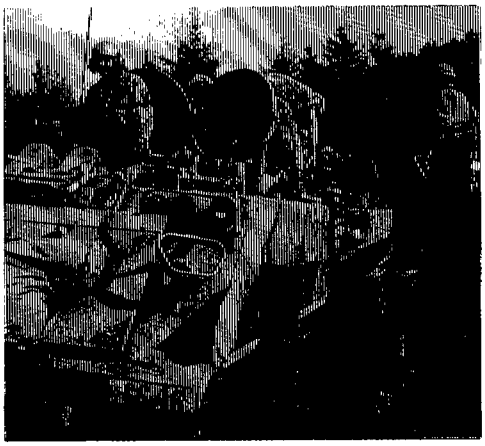
After all risks have been assessed, the values would be totaled and applied to a quick reference gauge.



Operations with a value of 0 to 12 would be judged as **low risk**. A value of 13 to 23 is seen as a **caution** area; complete unit command involvement is warranted. A "caution" rating should be given special consideration if only one or two elements have significantly raised the overall risk level. For example, a long flight through changing time zones immediately before a 48-hour tactical mission would be cause for serious concern even though the operation's overall risk assessment might fall well within the "caution" range. **High risk** operations assigned a value of 24 to 30 require coordination, before executing the mission, with the next higher level of command external to the organization making the assessment.

To demonstrate the assessment technique, let's look at three scenarios involving a mechanized infantry troop mission. Only the assessment elements will be varied.

Any increase in a mission's level of difficulty produces a corresponding increase in the level of risk involved.



Scenario 1. Your mechanized infantry unit will participate in Operation Swift Strike at Fort Stewart, Georgia. You've known about the mission for several weeks and have had specific guidance on tasks to be accomplished and plenty of time to prepare for the mission. The 8-hour tactical operation seems tailor-made for your unit because you have been well trained in the tactics to be employed. You've been in garrison for 2 weeks checking and pulling maintenance on newly issued equipment, your soldiers are well rested, morale is high, and the weather is ideal. You tell yourself this mission should be a snap.

Element	Assessment Elements	Risk Value
Planning	Guidance is quite specific and an extended amount of preparation time is available.	1
Supervision	Mission is categorized as organic day tactical.	2
Soldier endurance	Unit has been in garrison and is fully rested.	1
Soldier selection	Simple undertaking for highly qualified unit that has operated together for an extended period of time.	1
Weather	Clear and dry; temperature is 75° F.	1
Complexity	Play is planned for 8 hours.	2
Equipment	Equipment is new and highly maintained.	1

Risk value = 9 (low risk)

Scenario 2. Your mechanized infantry unit will participate in Operation Hunter/Killer at Baumholder, Germany. This is an annual exercise, and you have received specific guidance on your mission taskings. The taskings have been recently performed well in another exercise, and your unit is well prepared. The majority of your equipment is new and field-proven with your troops. There are no significant maintenance problems. Summertime drizzle is expected with temperatures of about 65° F. The only areas of concern are that your unit has not participated in this exercise before and does not know the terrain, the operation requires an intensive 48 hours of continuous effort, and you will be required to start your mission as soon as you arrive.

Element	Assessment Elements	Risk Value
Planning	Guidance is specific and preparation time has been extensive.	1
Supervision	Mission is categorized as organic night tactical.	3
Soldier endurance	Unit will make a trans-Atlantic flight just prior to mission tasking.	5
Soldier selection	Well prepared and practiced taskings for a cohesive unit.	1
Weather	Some drizzle; temperature 65° F.	2
Complexity	Tasking will run intensively for 48 hours.	5
Equipment	Equipment is new and highly maintained.	1

Risk value = 18 (caution)

The key factor in detecting significant risk is to maintain a strong organizational mission perspective.

Scenario 3. Your mechanized infantry unit will participate in Operation Quick Kill at Fort Benning, Georgia. You received your mission alert on short notice due to an administrative oversight and there is some confusion as to the tasking. It appears you will be OPCON to a nonmechanized unit that has never worked with a mechanized unit before. To make matters worse, you've just received several new members to your unit who have only recently been OJT-qualified, your unit has just returned from a demanding FTX, the temperature is forecast to be near freezing with fog, and the daylight attack operation has been extended from 8 to 24 hours. Your only positive thought is that at least you have new equipment with a combat readiness of C-1.

Element	Assessment Elements	Risk Value
Planning	Due to an administrative oversight, request for mission arrives late at unit. Confusion exists as to exact tasking.	5
Supervision	Mission is categorized as OPCON day tactical.	4
Soldier selection	Platoon has just received several new members from basic training. One squad leader has just been assigned. Risk value is judged routine OJT.	4
Soldier endurance	Unit has just returned from a demanding field training exercise.	5
Weather	Front is passing through operational area. Temperature will dip to near freezing with fog forecast.	4
Complexity	Operation has been extended to 24 hours.	4
Equipment	New equipment with combat readiness of C-1.	1

Risk value = 27 (high risk)

Practical Exercise

To get an idea of how simple it is to apply the process described here, take a moment to perform risk assessments of the following scenarios.

Cold Weather Mechanized FTX. Your mechanized infantry battalion has been tasked to participate in Operation Brimfrost, staging out of Fort Wainwright, Alaska. Six months ago, your infantry battalion converted to a new mechanized TOE. The plan calls for the battalion to convoy from Anchorage to Wainwright immediately after arrival in Alaska on 20 January and fall in on pre-positioned equipment. Although you have known of the requirement for more than a year, it seems that, as the deployment date approaches, the tactical play you were briefed on is starting to change rapidly. The battalion is highly motivated and looking forward to the 10-day operation. Scheduled flight time via C-141 is 8 hours.

Field Artillery Night Move. Your field artillery battalion has been tactical for 8 days undergoing an ARTEP evaluation. The planned night move scheduled for tomorrow has just been rescheduled for tonight due to forecast severe weather. In fact, you have just received a 2-hour warning order. Radio communications throughout the battalion have been poor due to atmospheric conditions. Weather is deteriorating rapidly. Two of the batteries have new commanders. The battalion in the last 4 months has received 40 new people, MOS trained at Fort Sill. This is your first experience with Camp Swampy.

The point is, without a risk assessment, scenario 3's high-risk mission might have been conducted without a full appreciation of the risks involved. It's also important to note that a "caution" rating signals the need for serious consideration. For example, in scenario 2, the soldier endurance value of 5 combined with the complexity value of 5 could outweigh the minimal risk values of all the other elements..

It is important to note at this point that the risk elements are arbitrary in nature, and individual units are expected to modify and adjust elements to meet local needs. For example, units operating in arctic climates would have to adjust the weather matrix; ranger units would modify the soldier endurance and mission complexity matrices to meet more demanding requirements.

What about specific hazards? The risk matrix gives you an overview of the inherent risks of the operation. In addition to this general perspective, you need to detect specific hazardous situations; e.g., dangerous artillery support plans, specific hazards of a river crossing, etc. The hazard assessment provides this detail.

Hazard assessment is the initial examination of an operation's hazards and their implications. It is normally based on the mission analysis and takes place before the details of an operation have been completely defined. Hazard assessment has one objective. It defines, at the earliest possible point in the operational life cycle, what hazards can be expected in each of the major operational phases. Doing this early permits dealing with these hazards when they are still preliminary; i.e., when the operation is still being planned. This assures that hazard controls can be developed as the operation evolves rather than tacking them on later, often as an afterthought.

Generally, a hazard assessment simply consists of taking 10 to 15 minutes, perhaps with a couple of platoon leaders, to list the specific hazards associated with each operational phase. If time permits, it may be useful to

When operating in the high-risk zone, everyone involved must be aware of the risk implications.

Airborne Operation FTX. You have been tasked to take your airborne battalion consisting of 1,780 personnel from Fort Bragg, NC, to Fort Irwin, CA, to conduct a mass tactical parachute assault using five drop zones (DZs). C-141s have been laid on to support the operation. Flight time to DZ has been calculated at 5+30. Two hours have been allocated for pre-mission staging. Coordination for this joint service operation has not gone smoothly; intraservice rivalry has been intense. The battalion is highly trained and motivated, but has recently received several new items of equipment such as the Dragon Missile Jump Pack that the troops are not totally familiar with. The tactical play calls for the drop to be made at 800 feet, 2 minutes after an artillery preparation. Timing is critical. The DZs are flat, large areas containing low-lying shrubbery and rocks. Weather at the DZ is forecast to be clear. Winds the past several days have been high with gusts approaching 35 knots. As you load, you are told the jump will be covered by national television.

Answers

While there are no right or wrong answers, in training classes a pretty consistent 85 percent of students answer within ±2 of the following values.

Cold weather mechanized FTX: 18.
Field artillery night move: 20.
Airborne operation FTX: 24.

ask the post or division safety office for summaries of accidents that have occurred in similar operations.

What are your risk-reduction options? The use of risk matrices and hazard analyses will define the kinds and significance of hazards faced in an operation. Now the task is to reduce the risk **without** significant adverse impact on operational objectives.

The countermeasure option checklist below has direct application to the development of risk-reduction options. You can use it to develop a full array of possibilities and then weed out those that are clearly impractical. The product of the risk-reduction phase should be a list of options that are practical, although not necessarily desirable, for the particular operation.

Countermeasure options:

Eliminate the hazard. Eliminate the hazard totally, if possible, or substitute a less hazardous alternative.

Control the hazard. Reduce the magnitude of the hazard or provide containment or barriers.

Change operational procedures. Modify operational procedures to minimize risk exposure consistent with mission needs.

Educate. Train personnel in hazard recognition, avoidance, and defeating.

Motivate. Motivate personnel to use effective hazard-avoidance actions.

A key factor in detecting significant risk is to maintain a strong organizational mission perspective. Adapt these basic assessment elements to fit your organizational needs. You can also develop additional matrix charts that blend in special considerations. One caution—keep the process simple. The idea is to develop a quick measure for risk and then determine an array of options for eliminating or controlling that risk.

The risk management approach gives commanders as much capability as possible with the least amount of potential risk.

The Risk Management Process

1. **Risk identification**
   This is risky, this isn't.
2. **Risk evaluation and quantification**
   The risk is this great.
3. **Risk reduction**
   Risk can be reduced by this and this.
4. **Risk decision making**
   This risk we can live with, this we can't.
5. **Risk decision followup**
   Is the risk and benefit as projected?
6. **Risk research**
   What is the risk? What risk is essential?

Advantages of Risk Management for Command

- Detect risks before losses.
- Quantify risk.
- Provide risk reduction alternatives.
- Better management decisions.
- Greater integration of safety.
- Increased mission capability.

Completing integration of safety into the operational process. At this point, you, for the investment of as little as 30 to 60 minutes of your time, should have a thorough insight into the risks you will face in the operation and the risk reduction options available to you. All this is achieved **before** final operational decisions are made or a single oporder is issued. From this point, the safety process becomes a totally integrated aspect of the operational process. There must be no distinction **whatsoever.** The operational process continues with the final selection of specific tactical procedures and the issuing or briefing of orders. These final tactical procedures are influenced by, but not dominated by, risk considerations. Ultimately, you must balance training needs against potential risk costs.

Risk reduction measures are an important factor in the details of tactical procedures and will be a meaningful part of written and verbal orders. Similarly, safety checks, special training and briefings, revisions to SOP, etc., are all accomplished as an integrated part of the operational process.

In summary, the effective commander defines his objectives and standards of performance for each operation he conducts. These objectives and standards include risk management factors as the full equal of the tactical, logistical, and leadership components.

What's the payoff? The risk management approach gives commanders a tool to improve efficiency, effectiveness, and safety in all operations. The payoff is in increased readiness as a result of safer, smarter, more beneficial training.

Risk management permits the execution of realistic training scenarios not possible without risk management procedures due to their high potential cost in accidents. It also minimizes personnel and materiel losses in day-to-day training activities. Finally, leaders who routinely use risk management techniques to make risk decisions in training are prepared to make better risk decisions in wartime, resulting in better tactical decisions and thus greater mission potential.